

CLAIMS

1. A turbine airfoil comprising:
transversely spaced apart pressure and suction sidewalls joined together at chordally opposite leading and trailing edges and extending in span from a root to a tip;
a septum spaced between said pressure and suction sidewalls to define with said sidewalls first and second cooling circuits extending in span along opposite sides of said septum and converging between said leading and trailing edges;
said first circuit being disposed along said pressure sidewall, and said second circuit being disposed along said suction sidewall and extending aft from said first circuit to said trailing edge; and
an array of pins extending inwardly from said pressure sidewall at a discharge end of one of said first and second circuits, and said pins decrease in length to conform with said one circuit converging between said leading and trailing edges.
2. An airfoil according to claim 1 wherein said first circuit includes an elongate first outlet slot extending in span along said pressure sidewall, and said second circuit includes a row of second outlet apertures terminating adjacent said trailing edge.
3. An airfoil according to claim 2 wherein said array of pins is disposed in said first circuit upstream from said first outlet slot thereof for discharging cooling air in a continuous film along said slot.
4. An airfoil according to claim 3 wherein said second circuit includes a bridge integrally joining said suction sidewall to said septum at said pin array.
5. An airfoil according to claim 4 further comprising a second array of said pins disposed in said second circuit upstream from said second outlet apertures thereof.
6. An airfoil according to claim 5 wherein said second pin array is disposed downstream

from said first pin array, and integrally joins together said pressure and suction sidewalls.

7. An airfoil according to claim 6 wherein:

said first circuit includes a single channel extending in span to provide a common inlet converging to said first array of pins; and

said second circuit includes a plurality of bridges integrally joining together said suction sidewall to said septum to define a serpentine circuit for discharging said cooling air through second outlet apertures.

8. An airfoil according to claim 6 wherein said pins are spaced apart in span and chord along said pressure sidewall for providing a circuitous flowpath therebehind.

9. An airfoil according to claim 6 wherein said pins have a uniform spacing, and uniform configuration.

10. An airfoil according to claim 6 wherein said septum commences behind said leading edge integrally with said suction sidewall, and terminates in front of said trailing edge integrally with said pressure sidewall.

11. A turbine airfoil 12 comprising:

spaced apart pressure and suction sidewalls joined together at chordally opposite leading and trailing edges and extending in span from a root to tip;

a septum spaced between said pressure and suction sidewalls to define with said sidewalls two cooling circuits on opposite sides of said septum converging between said leading and trailing edges; and

an array of pins extending inwardly from said pressure sidewall at a discharge end of one of said two circuits, and said pins decrease in length to conform with said one circuit converging between said leading and trailing edges.

12. An airfoil according to claim 11 wherein said septum commences behind said leading

edge integrally with said suction sidewall, and terminates in front of said trailing edge integrally with said pressure sidewall.

13. An airfoil according to claim 12 wherein said two cooling circuits extend in span along opposite sides of said septum, with a first one of said circuits being disposed along said pressure sidewall, and a second one of said circuits being disposed along said suction sidewall and extending aft from said first circuit to said trailing edge.

14. An airfoil according to claim 13 wherein said first and second circuits include corresponding first and second outlets spaced apart chordally on said pressure sidewall.

15. An airfoil according to claim 14 wherein said first outlet comprises an elongate slot extending in span along said pressure sidewall, and said second outlet comprises a row of apertures terminating adjacent said trailing edge.

16. An airfoil according to claim 15 wherein said array of pins is disposed in said first circuit upstream from said first outlet slot thereof for discharging cooling air in a continuous film along said slot.

17. An airfoil according to claim 16 wherein said first circuit includes a single channel extending in span to provide a common inlet converging to said array of pins.

18. An airfoil according to claim 16 wherein said second circuit includes a bridge integrally joining said suction sidewall to said septum at said pin array.

19. An airfoil according to claim 18 wherein said second circuit includes a plurality of bridges integrally joining together said suction sidewall to said septum to define a serpentine circuit for discharging said cooling air through said second outlet apertures.

20. An airfoil according to claim 19 further comprising a second array of said pins

disposed in said second circuit upstream from said second outlet apertures thereof.

21. An airfoil according to claim 20 wherein said second pin array is disposed downstream from said first pin array, and integrally joins together said pressure and suction sidewalls.

22. An airfoil according to claim 15 wherein said array of pins is disposed in said second circuit.

23. An airfoil according to claim 22 wherein said second circuit includes a plurality of bridges integrally joining together said suction sidewall to said septum to define a serpentine circuit for discharging said cooling air through said second outlet apertures.

24. An airfoil according to claim 15 wherein said pins are spaced apart in span and chord along said pressure sidewall for providing a circuitous flowpath therebehind.

25. An airfoil according to claim 24 wherein said pins have a uniform spacing, and uniform configuration.